

uose, 6 to 8 lines long.—Collected at Alamosa in Sonora by *Dr. Ed. Palmer*, 1890, no. 407.

Calamagrostis densus n. sp.—Culms in large patches, from strong rootstocks, 3 to 4 ft. high, robust, leafy, 5 to 6 nodes; the lower sheaths loose and longer than the internodes, the middle ones shorter than the internodes, the upper including the base of the panicle; leaves often a foot long, rigid, plane or becoming somewhat involute at the long slender points, somewhat scabrous, as are the sheaths; ligule 1 line long, lacerate: panicle strict, lance-oblong, 4 to 6 inches long, rachis slightly scabrous, branches somewhat verticillate, appressed, 1 inch long and densely flowered: spikelets crowded, 2 to $2\frac{1}{2}$ lines long; outer glumes linear-lanceolate, nearly equal, acute, slightly scabrous, margins slightly scarious; third (or flowering) glume a little shorter, narrow, apex slightly toothed and mucronate, a few short hairs at the base; awn, twisted near the base, a little longer than its glume; palea a little shorter than the glume, thin; sterile tuft, slender, one-third to one-half as long as the glumes, with few hairs.—Collected near Julian, San Diego co., California, by *C. R. Orcutt*.

Calamagrostis kœlerioides n. sp.—Culms erect, 2 feet high, rather rigid, smooth: leaves 2 to 6 inches long, narrow, somewhat scabrous, ligule conspicuous, laciniate, blade rigid, pointed, the upper very short: panicle spike-like, narrow, 3 to 4 inches long, the branches in short, approximate (or at the base rather distant) clusters: spikelets about 2 lines long, linear-lanceolate, rather smaller, but otherwise much as in *Calamagrostis densus*; the panicle having much the appearance of *Kœleria cristata*.—Collected near Julian, San Diego co., California, by *C. R. Orcutt*.

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BRIEFER ARTICLES.

Simple mechanism to show geotropism.—Take the works of an old clock run by a weight rather than a spring and support them horizontally, i. e. with the shafts vertical. The weight is to be carried over a pulley outside the works and the pendulum is to be removed so that the wheels may be made to revolve at a much more rapid rate than in the clock. One of the shafts, that bearing the scape wheel, is longer

than the rest, so that the scape wheel is outside the frame, i. e. above it in the position described, being supported by a bearing not in the frame itself, but in a separate piece bent and riveted to the frame. This piece must be cut away and a new bearing made for the shaft under the scape wheel instead of above, which any ingenious boy can easily do. This leaves the scape wheel free to carry the seed pans.

Solder the middle of a stout, horizontal brass wire six inches long to the face of the scape wheel, and to each end of this wire a deep tin pill-box, an inch and a half in diameter, one for a seed pan and the other to be filled with ballast for a counterpoise. The edge of the pill-box, not its face, should be towards the wheel, and the face of it should be inclined at an angle of about sixty degrees to the horizon so that the radicles of the germinating seeds in their downward growth may press against the advancing face of the box. Most of this face should be cut away and a piece of glass put inside to serve as a window. Against this put the seeds, already germinated so that their radicles begin to appear, placing the radicles so as to point downward; fill the box with moist saw-dust, and set it going in a warm place, using a heavy driving weight (I used about twelve pounds). This will make the brass arms carrying the pill-boxes revolve at a sufficient rate to create considerable centrifugal force in the boxes. The germinating radicles will feel the force of this enough to deflect them at a considerable angle from the perpendicular.

The apparatus will run several hours and if you do not want to sit up nights to wind it, all the better, as the direction of growth during the night will be so obviously different from that during the day when the apparatus is running as to make the experiment more conclusive.—GOODWIN D. SWEZEY, *Crete, Nebraska*.

Notes from Columbus, Ohio.—Among my last summer's collections from this vicinity was a form of *Bidens connata* Muhl. which was typical in every respect except that it had upwardly barbed awns. Dr. Sereno Watson, to whom the specimen was submitted, pronounced it unchanged in other characters. In making a revision of Sullivant's catalogue of plants of this vicinity, I find mention of plants near *B. frondosa* L., "except smaller and smoother; heads fewer-flowered, with pappus upwardly scabrous."

The following species of western plants, with the exception of *Dysodia* (not heretofore known in this locality), were collected the last of October about the winter-quarters of Sells Brothers' Circus, at Sellsville, Ohio, near Columbus, the *Croton* alone being out of bloom: *Erodium cicutarium*, *Aster pauciflorus*, *Amphiachyris dracunculoides*, *Dysodia chrysanthemoides*, *Gutierrezia Texana*, *Helenium nudi-*